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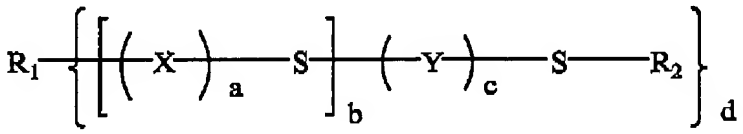
IN THE CLAIMS

1. (Original) A method for producing a catalyst composition which catalyzes the formation of bisphenols from aromatic hydroxy compounds and carbonyl containing compounds, said method comprising the step of attaching a poly-sulfur mercaptan promoter component to a solid acid support component comprising a protic acid functionality, said poly-sulfur mercaptan promoter component having the following structure (I),



(I)

wherein R_1 is a benzimidazole functionality;

wherein a is between about 0 and about 11;

wherein b is between about 1 and about 11;

wherein c is between about 1 and about 11;

wherein d is between about 1 and about 5;

wherein X is a linking functionality which is one member selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms;

wherein Y is a linking functionality which is one member selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least

6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms; and

wherein R_2 is one member selected from the group consisting of a hydrogen, a secondary aliphatic functionality, a tertiary aliphatic functionality, an ester functionality, a carbonate functionality, and a benzyl functionality which is attached via the benzylic methylene carbon.

2. (Original) The method of claim 1, wherein said tertiary aliphatic functionality is one member selected from the group consisting of a branched aliphatic functionality, and a cyclic aliphatic functionality.

3. (Original) The method of claim 1, wherein said R_2 functionality is one member selected from the group consisting of an isopropyl functionality, an isobutyl functionality, a tertiary butyl functionality, a tertiary amyl functionality, a cyclopentyl functionality, a benzyl, a 4-methoxybenzyl functionality, a 1-methylcyclohexyl functionality, and a cyclohexyl functionality.

4. (Original) The method of claim 1, wherein said ester functionality is one member selected from the group consisting of an acetate functionality, a propionate functionality, and a benzoate functionality.

5. (Original) The method of claim 1, wherein said carbonate functionality is one member selected from the group consisting of an alkyl carbonate functionality, and an aromatic carbonate functionality.

6. (Original) The method of claim 1, wherein the bisphenol which is being formed is 4,4'-isopropylidenediphenol.

7. (Original) The method of claim 1, wherein the carbonyl containing compound is a ketone or an aldehyde.

8. (Original) The method of claim 1, wherein the aromatic hydroxy compound is phenol, and the carbonyl containing compound is acetone.

9. (Original) The method of claim 1, wherein the attachment step is performed in an aqueous solution comprising water.

10. (Original) The method of claim 1, wherein said solid acid comprises at least one member selected from the group consisting of polystyrene, a zeolite, and silica.

11. (Original) A method for producing a catalyst composition which catalyzes the formation of bisphenols from aromatic hydroxy compounds and carbonyl containing compounds, said method comprising the step of attaching a poly-sulfur mercaptan promoter component to a polymeric resin component comprising a protic acid functionality, wherein said poly-sulfur mercaptan promoter component is a functionalized benzimidazole mercaptan.

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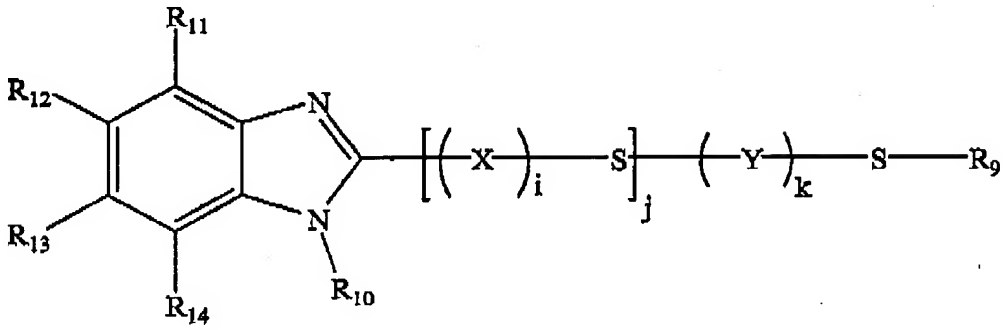
12. (Currently Amended) The method of claim 11, wherein said a functionalized benzimidazole mercaptan has the structure (III),



(III)

wherein i is between about 0 and about 11;

wherein j is between about 1 and about 11;

wherein k is between about 1 and about 11;

wherein R_9 is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached to the terminal sulfur atom via the benzylic methylene carbon;

wherein R_{10} is one member selected from the group consisting of a hydrogen, an aliphatic carbonyl functionality comprising about 1 to about 11 carbon atoms, an aliphatic functionality comprising between about 1 and about 11 carbon atoms, an aromatic carbonyl functionality comprising at least about 7 carbon atoms, and an aromatic functionality comprising at least about 6 carbon atoms; ~~and~~

wherein each of R_{11}, R_{12}, R_{13} and R_{14} are independently one member selected from the group consisting of a hydrogen, a fluoride, a bromide, a chloride, an iodide, a vinyl group, a hydroxide, an alkoxide functionality comprising between about 1 and about 11 carbon atoms, an

aryloxide functionality comprising at least about 6 carbon atoms, an aliphatic functionality comprising between about 1 and about 11 carbon atoms, an aromatic functionality comprising at least about 6 carbon atoms, a cycloaliphatic ring comprising at least about 5 carbon atoms, said cycloaliphatic ring being fused to the benzimidazole arene ring through an adjacent ring substituent, and a cycloaromatic ring comprising at least about 6 carbon atoms, said cycloaromatic ring being fused to the benzimidazole arene ring through an adjacent ring substituent.;

wherein X is a linking functionality which is selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms; and

wherein Y is a linking functionality which is selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms.

13. (Original) The method of claim 11, wherein the bisphenol which is being formed is 4,4'-isopropylidenediphenol.

14. (Original) The method of claim 11, wherein the carbonyl containing compound is a ketone or an aldehyde.

15. (Original) The method of claim 11, wherein the aromatic hydroxy compound is phenol, and the carbonyl containing compound is acetone.

16. (Original) The method of claim 11, wherein the attachment step is performed in an aqueous solution comprising water.

17. (Original) The method of claim 11, wherein said polymeric resin comprises at least one member selected from the group consisting of polystyrene, a zeolite, and silica.

18. (Original) The method of claim 17, wherein said polymeric resin further comprises divinylbenzene.

19. (Original) The method of claim 18, wherein the amount of divinylbenzene is up to about 12 percent of the total weight of the polymeric resin.

20. (Original) The method of claim 11, wherein said protic acid functionality comprises at least one member selected from the group consisting of a sulfonic acid functionality, a phosphonic acid functionality, and a carboxylic acid functionality.

21. (Original) The method of claim 12, wherein the linking functionality X, is the same as the linking functionality Y.

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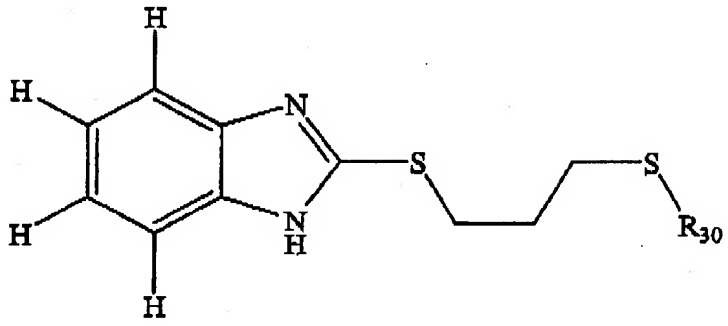
22. (Original) The method of claim 12, wherein the bisphenol is 4,4'-isopropylidenediphenol, the aromatic hydroxy compound is phenol, the carbonyl containing compound is acetone, and said promoter component is,



wherein R_{30} is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached via the benzylic methylene carbon.

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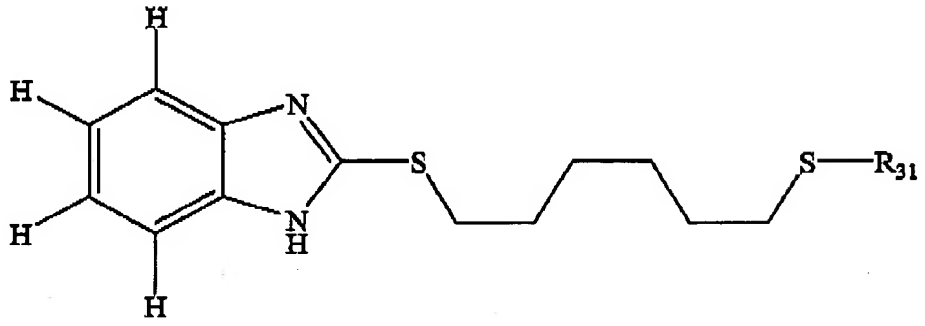
23. (Original) The method of claim 12, wherein the bisphenol is 4,4'-isopropylidenediphenol, the aromatic hydroxy compound is phenol, the carbonyl containing compound is acetone, and said promoter component is,



wherein R_{31} is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached via the benzylic methylene carbon.

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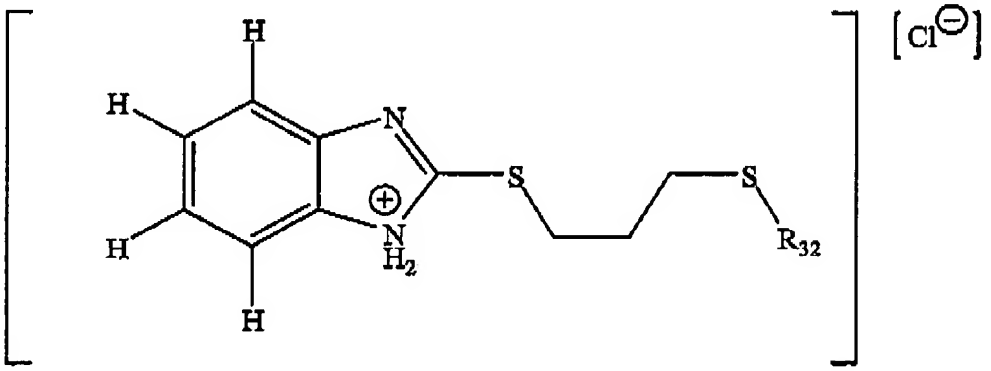
24. (Original) The method of claim 12, wherein the bisphenol is 4,4'-isopropylidenediphenol, the aromatic hydroxy compound is phenol, the carbonyl containing compound is acetone, and said promoter component is,



wherein R_{32} is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached via the benzylic methylene carbon.

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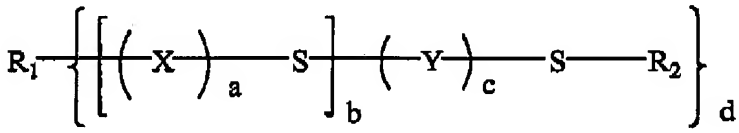
25. (Original) A method for forming bisphenols, comprising the step of reacting an aromatic hydroxy compound with a carbonyl containing compound in the presence of a catalyst composition, said catalyst composition comprising a solid acid component and a poly-sulfur mercaptan promoter component having the following structure (I),



(I)

wherein R_1 is a benzimidazole functionality;

wherein a is between about 0 and about 11;

wherein b is between about 1 and about 11;

wherein c is between about 1 and about 11;

wherein d is between about 1 and about 5;

wherein X is a linking functionality which is one member selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms;

wherein Y is a linking functionality which is one member selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms; and

wherein R_2 is one member selected from the group consisting of a hydrogen, a secondary

aliphatic functionality, a tertiary aliphatic functionality, an ester functionality, a carbonate functionality, and a benzyl functionality which is attached via the benzylic methylene carbon.

26. (Original) The method of claim 25, wherein said tertiary aliphatic functionality is one member selected from the group consisting of a branched aliphatic functionality, and a cyclic aliphatic functionality.

27. (Original) The method of claim 25, wherein said R_2 is one member selected from the group consisting of a, an isopropyl functionality, an isobutyl functionality, a tertiary butyl functionality, a tertiary amyl functionality, a cyclopentyl functionality, a benzyl, a 4-methoxybenzyl, a 1-methylcyclohexyl functionality, and a cyclohexyl functionality.

28. (Original) The method of claim 25, wherein said ester functionality is one member selected from the group consisting of an acetate functionality, a propionate functionality, and a benzoate functionality.

29. (Original) The method of claim 25, wherein said carbonate functionality is one member selected from the group consisting of an alkyl carbonate functionality, and an aromatic carbonate functionality.

30. (Original) The method of claim 25, wherein the bisphenol which is being formed is 4,4'-isopropylidenediphenol.

31. (Original) The method of claim 25 wherein the aromatic hydroxy compound is phenol.

32. (Original) The method of claim 25, wherein the carbonyl containing compound is a ketone or an aldehyde.

33. (Original) The method of claim 32 wherein the ketone is acetone.

34. (Original) The method of claim 25, wherein said solid acid comprises at least one member selected from the group consisting of polystyrene, a zeolite, and silica.

35. (Original) The method of claim 25 wherein said solid acid is a sulfonic acid functionalized polymeric resin.

36. (Original) The method of claim 35, wherein said polymeric resin further comprises divinylbenzene.

37. (Original) The method of claim 36, wherein the amount of divinylbenzene is up to about 12 percent of the total weight of the polymeric resin.

38. (Original) The method of claim 25 wherein said solid acid component comprises at least one member selected from the group consisting of a sulfonic acid functionality, a phosphonic acid functionality, and a carboxylic acid functionality.

39. (Original) The method of claim 25, wherein the linking functionality X, is the same as the linking functionality Y.

40. (Original) A method for forming bisphenols, comprising the step of reacting an aromatic hydroxy compound with a carbonyl containing compound in the presence of a catalyst composition, said catalyst composition comprising a polymeric resin component comprising a protic acid functionality, and a poly-sulfur mercaptan promoter component, wherein said poly-sulfur mercaptan promoter component is a functionalized benzimidazole mercaptan.

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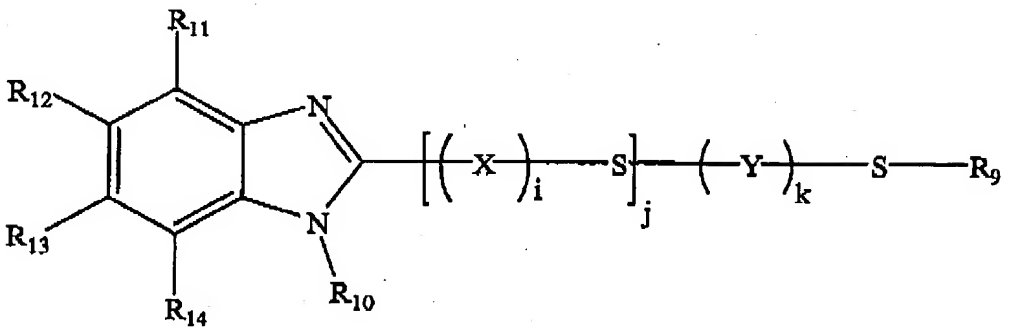
41. (Currently Amended) The method of claim 40, wherein said functionalized benzimidazole mercaptan has the structure (III),



(III)

wherein i is between about 0 and about 11;

wherein j is between about 1 and about 11;

wherein k is between about 1 and about 11;

wherein R_9 is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached to the terminal sulfur atom via the benzylic methylene carbon;

wherein R_{10} is one member selected from the group consisting of a hydrogen, an aliphatic carbonyl functionality comprising about 1 to about 11 carbon atoms, an aliphatic functionality comprising between about 1 and about 11 carbon atoms, an aromatic carbonyl functionality comprising at least about 7 carbon atoms, and an aromatic functionality comprising at least about 6 carbon atoms; ~~and~~

wherein each of R_{11}, R_{12}, R_{13} and R_{14} are independently one member selected from the group consisting of a hydrogen, a fluoride, a bromide, a chloride, an iodide, a vinyl group, a hydroxide, an alkoxide functionality comprising between about 1 and about 11 carbon atoms, an aryloxide functionality comprising at least about 6 carbon atoms, an aliphatic functionality comprising between about 1 and about 11 carbon atoms, an aromatic functionality comprising at least about 6 carbon atoms, a cycloaliphatic ring comprising at least about 5 carbon atoms, said cycloaliphatic ring being fused to the benzimidazole arene ring through an adjacent ring substituent, and a cycloaromatic ring comprising at least about 6 carbon atoms, said cycloaromatic ring being fused to the benzimidazole arene ring through an adjacent ring substituent;

wherein X is a linking functionality which is selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms; and

wherein Y is a linking functionality which is selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms.

42. (Original) The method of claim 40, wherein the bisphenol which is being formed is 4,4'-isopropylidenediphenol.

43. (Original) The method of claim 40, wherein the aromatic hydroxy compound is phenol.

44. (Original) The method of claim 40, wherein the carbonyl containing compound is a ketone or an aldehyde.

45. (Original) The method of claim 44, wherein the ketone is acetone.

46. (Original) The method of claim 40, wherein said polymeric resin comprises at least one member selected from the group consisting of polystyrene, a zeolite, and silica.

47. (Original) The method of claim 46, wherein said polymeric resin further comprises divinylbenzene.

48. (Original) The method of claim 47, wherein the amount of divinylbenzene is up to about 12 percent based on the total weight of the polymeric resin.

49. (Original) The method of claim 40, wherein said protic acid functionality comprises at least one member selected from the group consisting of a sulfonic acid functionality, a phosphonic acid functionality, and a carboxylic acid functionality.

50. (Original) The method of claim 41, wherein the linking functionality X, is the same as the linking functionality Y.

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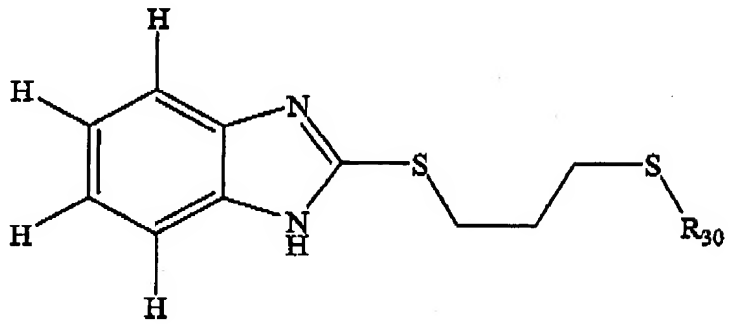
51. (Original) The method of claim 41, wherein the bisphenol is 4,4'-isopropylidenediphenol, the aromatic hydroxy compound is phenol, the carbonyl containing compound is acetone, and said promoter component is,



wherein R_{30} is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached to the terminal sulfur atom via the benzylic methylene carbon.

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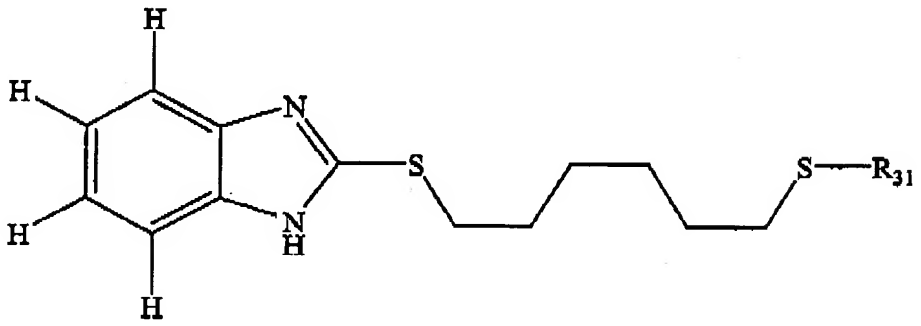
52. (Original) The method of claim 41, wherein the bisphenol is 4,4'-isopropylidenediphenol, the aromatic hydroxy compound is phenol, the carbonyl containing compound is acetone, and said promoter component is,



wherein R_{31} is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached to the terminal sulfur atom via the benzylic methylene carbon.

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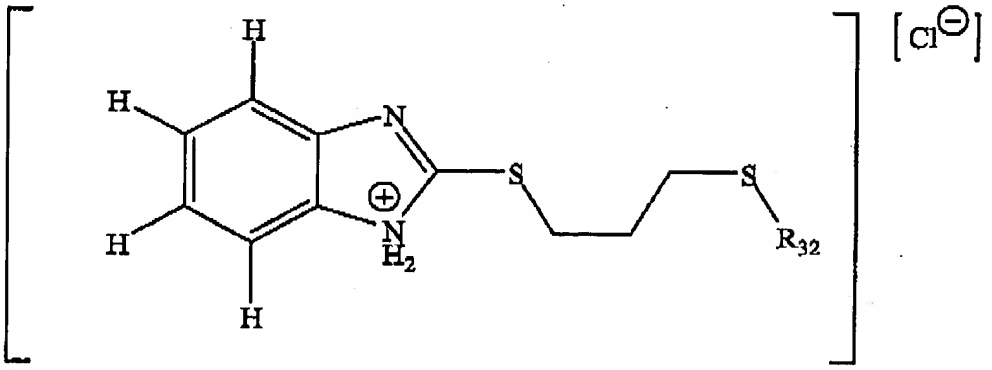
53. (Original) The method of claim 41, wherein the bisphenol is 4,4'-isopropylidenediphenol, the aromatic hydroxy compound is phenol, the carbonyl containing compound is acetone, and said promoter component is,



(XIV)

wherein R_{32} is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached to the terminal sulfur atom via the benzylic methylene carbon.

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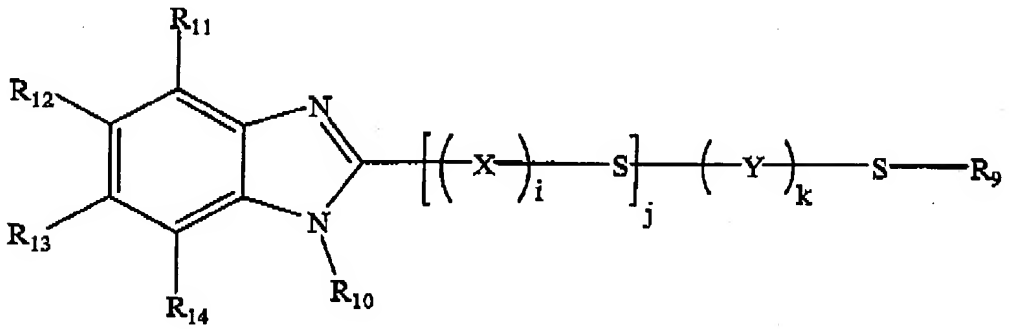
54. (Currently Amended) A benzimidazole compound having following the structure (III),



(III)

wherein i is between about 0 and about 11;

wherein j is between about 1 and about 11;

wherein k is between about 1 and about 11;

wherein R_9 is a hydrogen atom or a sulfur-protecting functionality which is one member selected from the group consisting of an aliphatic functionality comprising at least about 4 carbon atom, an ester functionality comprising between about 1 and about 11 carbon atoms, a carbonate functionality comprising between about 1 and about 11 carbon atoms, and a benzylic functionality comprising at least about 7 carbon atoms which is attached to the terminal sulfur atom via the benzylic methylene carbon;

wherein R_{10} is one member selected from the group consisting of a hydrogen, an aliphatic carbonyl functionality comprising about 1 to about 11 carbon atoms, an aliphatic functionality comprising between about 1 and about 11 carbon atoms, an aromatic carbonyl functionality comprising at least about 7 carbon atoms, and an aromatic functionality comprising at least about 6 carbon atoms; ~~and~~

wherein each of R_{11}, R_{12}, R_{13} and R_{14} are independently one member selected from the

group consisting of a hydrogen, a fluoride, a bromide, a chloride, an iodide, a vinyl group, a hydroxide, an alkoxide functionality comprising between about 1 and about 11 carbon atoms, an aryloxide functionality comprising at least about 6 carbon atoms, an aliphatic functionality comprising between about 1 and about 11 carbon atoms, an aromatic functionality comprising at least about 6 carbon atoms, a cycloaliphatic ring comprising at least about 5 carbon atoms, said cycloaliphatic ring being fused to the benzimidazole arene ring through an adjacent ring substituent, and a cycloaromatic ring comprising at least about 6 carbon atoms, said cycloaromatic ring being fused to the benzimidazole arene ring through an adjacent ring substituent;

wherein X is a linking functionality which is selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms; and

wherein Y is a linking functionality which is selected from the group consisting of a linear aliphatic chain comprising between about 1 and about 11 carbon atoms, a cyclic aliphatic ring comprising at least 5 carbon atoms, a cyclic aromatic ring comprising at least 6 carbon atoms, a cyclic aliphatic heterocycle comprising at least 3 carbon atoms, and a cyclic aromatic heterocycle comprising at least 3 carbon atoms.